FOUNDRY TRADE JOURNAL
Established 1903
WITH WHICH IS INCORPORATED THE IRON AND STEEL TRADES JOURNAL

Vol. 75 Thursday, February 15, 1945 No. 1487

An Appeal to Youth

For the first time in the long history of the foundry industry has an endeavour been made by co-operative effort to attract youth to the industry. The credit for this goes to the Manchester and District Ironfounders' Association, of 90, Deansgate, Manchester, 3. This enlightened body of manufacturers has published for free distribution to the schools in the area covered by the Association's activities, a 16-page, well illustrated, brochure designed to "sell" the idea of the foundry industry as a career for youths.

The choice of illustrations has been perhaps a little too close to the foundry floor, and it could have been rendered more glamorous by the inclusion of the finished entity—an aeroplane, a streamlined train, an automobile. With such pictures there should be the connecting link with the foundry. For instance, a suitable caption for a bomb would be "Over 1,000 castings have been built into this Block Buster." Yet, on the other hand, perhaps it is just as well to tell an honest story of diverse interests, for it is obvious that the compiler has had in mind, the stressing of the variety of the jobs to be undertaken in the manufacture of castings.

A second suggestion is that a slip of paper in the shape of a reply form should be included, which could usefully be worded: "I have read your book, 'The Foundry Industry and Your Career,' and would like to visit a foundry. I could come on any of the following days ..... ; Signed, ... ; address ..... ." Schoolboys are not too good at writing letters—and worse still at posting them!—but they do, unlike their parents, like filling in forms!

This booklet must be regarded as an advertisement in a magazine. It should originate enquiries. That is all any advertisement does. It is on the receipt of the enquiry that the serious business of selling to the customers really begins. In this case there is an invitation to write to the Association, in order to have a look round one or two foundries and ask some questions. Here, indeed, the real opportunity occurs. The reply must be couched in real friendly terms, and the arrangements must be such that they include the very simple participation in making of a mould, and present the resulting casting—a toy aeroplane or the outline of a tank, for example—to the boy as a souvenir. An individual visit—with or without parents—is preferable to tours of the works by classes. The chaperon, too, must be carefully chosen, for not only must he be sympathetic towards youth, but he must also be popular with the operatives. Again, the modern foundry is very complicated, and even though it involves much extra walking for the chaperon, there must be a proper routing of the visit. First the patternshop, then the arrival of the raw materials, their checking, analysis and storage, and finally metal melting. Following this, the youth should be shown the knock-out, the main provision of the sand, its preparation and journey to the moulds. Here a detour must be made to see the making of the cores, their drying and journey back to the moulding station. Then the coring, closing, and casting must be detailed, followed up by the casting and knocking out. Then the casting must be followed through the fettling shop to the despatch. Finally there must be a return to pick up the present. On all sales there must be a follow-up letter, suggesting further visits to other works, and discreet questions as to the reactions of the lad to his visit, perhaps in the form of a not too obvious *questionnaire*. These answers must be carefully studied to ascertain which are the bull selling points and where any weakness is disclosed.

No doubt other foundry employers' associations will want to emulate the example set by Manchester, and we understand that for a quite small amount of money, bulk supplies can be made available.

Contents

An Appeal to Youth, 125.—Forthcoming Events, 126.—To Present the American Exchange Paper, 126.—Association Technique de Fonderie, 126.—Some Observations on the Structure of Acid-Resistant Vitreous Enamels for Chemical Plant, 127.—A New Moulding Material, 130.—U.S. Malleable-Iron Castings Output, 130.—Reclaimed and Substitute Timbers for Patternmaking, 131.—Some Curious Wasters, 133.—Porous Metal for Bearings, 134.—Institute Elects New Members, 135.—Metal Price Uncertainties, 137.—Correspondence, 138.—Gray Iron Founders' Society, 138.—Personal, 140.—Obituary, 142.—Contracts Open, 142.—Antimony Control Removed, 142.

FORTHCOMING EVENTS

FEBRUARY 19.

Sheffield Society of Engineers and Metallurgists :—"The Manufacture of Seamless Steel Tubes," by Dr. J. W. Jenkin (Tubé Investments, Limited). At the Royal Victoria Station Hotel, Sheffield, 1, at 6 p.m.

FEBRUARY 23.

Manchester Association of Engineers :—"Reclaiming and Hardening of Engineering Components by Electrodeposition," by H. Merryweather. At the Engineers' Club, Albert Square, Manchester, at 6.30 p.m.

Keighley Association of Engineers :—"Resistance Welding," by J. Berry, M.Inst.W. At Devonshire Buildings, Devonshire Street, Keighley, at 7.30 p.m.

FEBRUARY 27.

Sheffield Metallurgical Association :—"Safety Pins and Swords," by Lord Halsbury. At the Sheffield Metallurgical Club, 198, West Street, Sheffield, 1, at 6.30 p.m.

MARCH 7.

Institution of Chemical Engineers :—Joint area meeting with the South Yorkshire Section of the Royal Institute of Chemistry. Visit to Nitrogen Fertilisers, Limited, Flixborough, in morning. Luncheon at the Blue Bell Hotel, Scunthorpe. "The Future Aspects of Research for Industry," by Dr. E. W. Smith, President of the Institute of Fuel.

MARCH 8.

Institute of Metals (London Local Section) :—Discussion on "Metals in Housing," to be opened by G. H. Friese-Greene. At 4, Grosvenor Gardens, London, S.W.1.

MARCH 10.

Keighley Association of Engineers :—Annual dinner, at 5.30 p.m., at which the guest of honour will be Sir Miles Thomas, D.F.C., vice-chairman of the Nuffield organisation.

Institute of British Foundrymen

FEBRUARY 17.

Bristol Branch :—"A Study in Moulding and Casting Technique for Small Steel Castings," by E. G. Kelly, O.B.E. At the Grand Hotel, Broad Street, Bristol, at 3 p.m.

Lincoln Section :—"Moulding Sands and Gases in Relation to Casting Defects," by G. W. Nicholls. At the Technical College, Lincoln, at 3 p.m.

FEBRUARY 24.

Birmingham Branch :—"Costs in a Jobbing Foundry," by H. E. E. Holladay, B.Sc. At the James Watt Institute, Great Charles Street, Birmingham, at 2.30 p.m.

East Midlands Branch :—"Some Thoughts on Foundry Management," by J. Roxburgh. At Loughborough College, at 6 p.m.

FEBRUARY 26.

Sheffield Branch :—"The Study of Liquid Metal Temperature and Solidification Range as a Foundry Control by Means of a Thermocouple," by R. C. Tucker, M.A. At the Royal Victoria Hotel, Sheffield, at 7 p.m.

FEBRUARY 28.

London Branch :—"Inoculated Irons," by A. E. McRae Smith, M.A. At the Charing Cross Hotel, London, W.C.2, at 7.30 p.m.

MARCH 3.

Bristol and West of England Branch :—"Plaster and Plastic Patternmaking and Low Melting Point Metals," by H. Plucknett. At the Imperial Hotel, Exeter, at 3 p.m.

The Malleable Founders' Society, of Union Commerce Building, Cleveland, 14, Ohio, is publishing in the near future a handbook covering the whole field of the manufacture of malleable cast iron. The advance notice does not say whether it will be for sale or private distribution.

TO PRESENT THE AMERICAN EXCHANGE PAPER

Mr. Frederick G. Sefing, who is to present the 1945 Exchange Paper to the Institute of British Foundrymen, is research metallurgist for the International Nickel Company, New York City, N.Y. He received his early education in high school and the Bethlehem Preparatory School, and later was graduated from the Lehigh University in metallurgical engineering in 1919, and in 1924 received his M.S. degree from the Pennsylvania State College.

Mr. Sefing has had a varied career. Successively, he was assistant metallurgist for the Hudson Motor Car Company, Detroit; metallurgist, Rockford Drop Forge, Rockford, Ill.; chemical metallurgist, Pennsylvania State College; metallurgist, Michigan State College, East Lansing, Michigan; and in 1937 became research metallurgist for the International Nickel Company, Bayonne, N.Y., and later was sent to their New York branch.

He has written extensively for the technical Press and has presented many articles before association meetings, on subjects of core strengths, grain size in medium carbon steels, data for determining oil combustion, structure of alloy cast iron, superhardening steels, superheating cast iron, melting characteristics of brass and bronze, normal and abnormal steels, and related subject matter.

Mr. Sefing is especially well known to the foundry industry in the United States and Canada through his work in the American Foundrymen's Association. For years he has been chairman of the Committee on Co-operation with Engineering Schools.

In his earlier work at Michigan State College he was instrumental in the development of regional gatherings of the Detroit Chapter, which were annual meetings held at Michigan State College. In addition, he has to his credit a large number of research and technical workers who entered the foundry field through his influence as instructor at the Michigan State College.

ASSOCIATION TECHNIQUE DE FONDERIE

Professor Chevenard, the President, informs us that the following prominent members of the Association Technique de Fonderie died between 1940 and 1943:—Mr. André Damour, past-president (1929-31) and hon. president, foundry owner at Bayard (Hte-Marne); Mr. Maurice Werts, past-president (1936-37) of the Fonderies les Fils de A. Werts, Pantin (Seine); Mr. Edmond Labbe, hon. member, Director of Technical Education; Mr. Charles Masson, past-vice-president, president of the Sté "Mécanique Moderne," Nancy (M. & M.); Mr. Henri Coqueugnot, general manager of the Union des Consommateurs des Produits Métallurgiques et Industriels, president of the Comité d'Organisation des Minerais de fer métropolitains; and Mr. François Renaud, Technical Editor of the Bulletin of the Association Technique de Fonderie.

SOME OBSERVATIONS ON THE STRUCTURE OF ACID-RESISTANT VITREOUS ENAMELS FOR CHEMICAL PLANT*

High-frequency spark test and the detection of voids in enamelled coatings

By G. E. CHARLISH, B.Sc., F.R.I.C. and E. J. HEELEY, Assoc. Met. (Sheff.)

Summary

Investigations have been made into the characteristics of acid-resisting enamels supplied for chemical plant purposes with the object of ascertaining the reason for the somewhat erratic behaviour of enamelled plant items under operating conditions. The application of the high-frequency spark test has revealed the presence of defects undetectable by visual examination and the "wet" electrical methods of testing enamelled surfaces. Microscopical examination of the point indicated as faulty during the application of the high-frequency spark test has enabled typical defects to be located accurately. The examination by metallographic methods of sections of enamelled coatings has revealed that the majority of the defects found by means of the high-frequency spark test are voids extending through the full thickness of the enamel. The provision of enamelled coatings free from these large void defects is essential for the satisfactory operation of enamelled items in chemical plant.

* Paper read at the Tenth Annual General Meeting of the Institute of Vitreous Enamellers.

Introduction

The advantages of a chemically highly acid-resistant vitreous enamel applied on cast-iron or mild-steel sur-

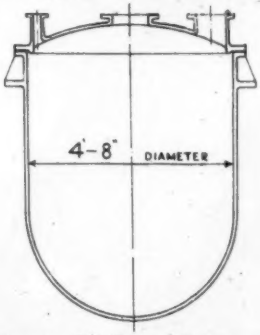


FIG. 1.—TYPICAL 500-GALL. CAST-IRON REACTION VESSEL HAVING BOLTED-ON COVER. ALL INTERNAL SURFACES ARE ENAMELLED.

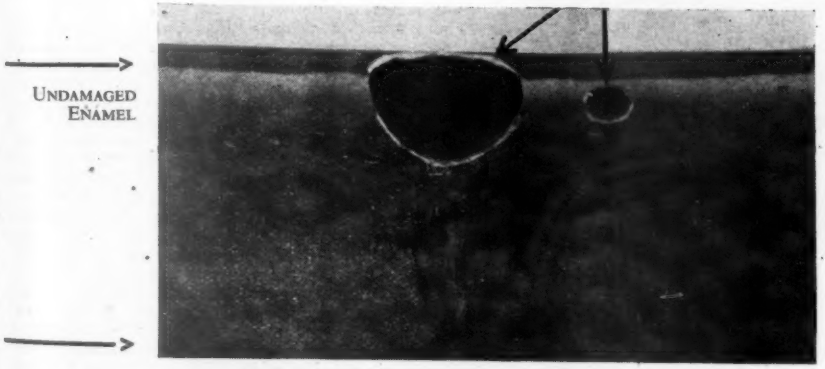


FIG. 2 (ACTUAL SIZE).—PORTION OF ENAMELLED AUTOCLAVE LINER (CAST IRON) SHOWING TWO REGIONS AT WHICH CORROSION WASTAGE OF BASIS METAL HAD OCCURRED.

Acid-resistant Vitreous Enamels

faces as a protection against chemical action have been appreciated for many years in the particular sphere of chemical industry with which the Authors are concerned. This is evidenced by the different types of enamelled plant items in common use, ranging from small tubes, thermometer pockets and similar items up

FIG. 3 (¼ ACTUAL SIZE).—LOWER END OF ENAMELLED MILD-STEEL BLOWLEG SHOWING EXTENT OF CORROSION WASTAGE AFTER USE IN THREE BATCHES ONLY.

to the large reaction vessels and still larger storage vessels.

Unfortunately, enamelled plant, taken as a whole, suffers from a disadvantage which is the cause of serious concern, *viz.*, its erratic behaviour as regards service conditions. The premature breakdown of some plant items has led, and still leads, to the loss of production of high-quality products, as well as involving heavy charges for plant maintenance. This erratic behaviour has come to be regarded more or less as characteristic of enamel linings and has led to restrictions in the use of such plant despite the obviously desirable qualities of enamelled coatings, particularly their acid-resistant properties in conjunction with the ability to operate successfully at temperatures up to 300 deg. C.

Some failures of enamelled plant items have had their origin in accidental mechanical damage to the enamel coating—a feature which may not be unexpected in view of the somewhat brittle and fragile character of materials of the glass family. This relative fragility—compared with the ductility of metals—is a feature which has to be accepted with this type of plant, and is one which need not cause much trouble if suitable precautions are observed in the handling of enamelled plant. The tendency to over-emphasise the relative fragility of enamel coatings and to attribute all failures to mechanical damage is to be avoided.

Type of Plant Employed

Many different types of plant items in which protection against corrosion is given by a film or lining of acid-resistant enamel are employed in the chemical industry; the following are mentioned as typical examples:—

(1) *Reaction Vessels.*—These range in size from quite small vessels to those of 750 galls. capacity or more. Reactions carried out in such vessels may involve corrosive media under pressure and at temperatures up to about 250 deg. C. An example of a widely used type of reaction vessel is shown in Fig. 1, which gives some idea of the dimensions of an enamelled cast-iron 500-gall. "blow-over" type of reaction vessel suitable for an internal working pressure of 40 lbs. per sq. in. This particular type of vessel is often fitted with a jacket for steam-heating purposes. Cooling water may also be applied in the jacket.

There are evident restrictions on the temperatures and pressures which can be employed in cast-iron vessels owing to the limitations of cast iron as a constructional material. Nevertheless, in practice, numerous reactions are carried out in enamelled cast-iron vessels, and their use would no doubt be extended if more reliance could be placed on the enamel coatings.

Autoclaves are a specialised type of reaction vessel in which the operating pressures are generally greater than those permissible in vessels constructed of cast iron. Many of the older types of autoclaves are steel castings, but vessels of welded mild steel are being more widely employed. In such vessels it has been the practice not to apply the enamel to the pressure vessel itself, but to provide a separate enamelled liner, generally of cast iron, to prevent access of the corrosive contents to the pressure vessel. The space between the liner and the vessel may be filled with a lead alloy of low melting point. The materials forming the liner—metal and enamel—are not called upon to carry the hoop stress due to the internal pressure in the reaction vessel, owing to the pressure being the

same on both outside and inside of the enamelled liner. Though there are, in the Authors' view, great possibilities in the utilisation of enamel coatings applied directly to welded steel autoclaves, past experience of the premature and often local failure of the enamel linings has resulted in reluctance to apply the protective medium to the autoclave itself.

Whilst replaceable liners are effective in preserving the vessel proper from serious corrosion attack, they cannot be regarded as a cheap means of affording protection because of the need for replacement of the liner as soon as local failure of the enamel coating occurs. Premature failures of enamelled liners generally involve some loss of production in addition to the expense involved in replacement, which, as can be imagined, is not a simple matter, especially in a large vessel.

(2) *Auxiliary Equipment.*—This includes items such as thermometer pockets, blowlegs, agitators, connecting pipes, etc., either cast iron or mild steel being employed as the basis metal.

(3) *Storage Vessels.*—In many of these vessels the working conditions of the enamel are in general not so onerous as in the case of reaction vessels where the enamel is subjected to temperatures of a higher order as well as variation in temperature and stress.

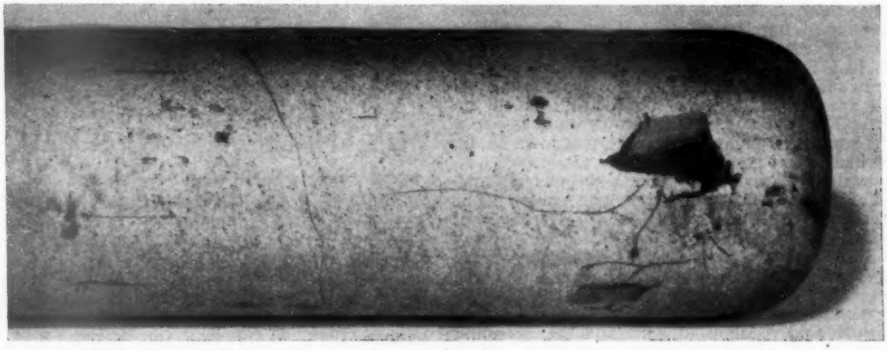


FIG. 4 (SLIGHTLY LESS THAN ACTUAL SIZE).—END OF THERMOMETER POCKET SHOWING CAVITY IN BASIS METAL DUE TO CORROSION. (MECHANICALLY DAMAGED ENAMEL).

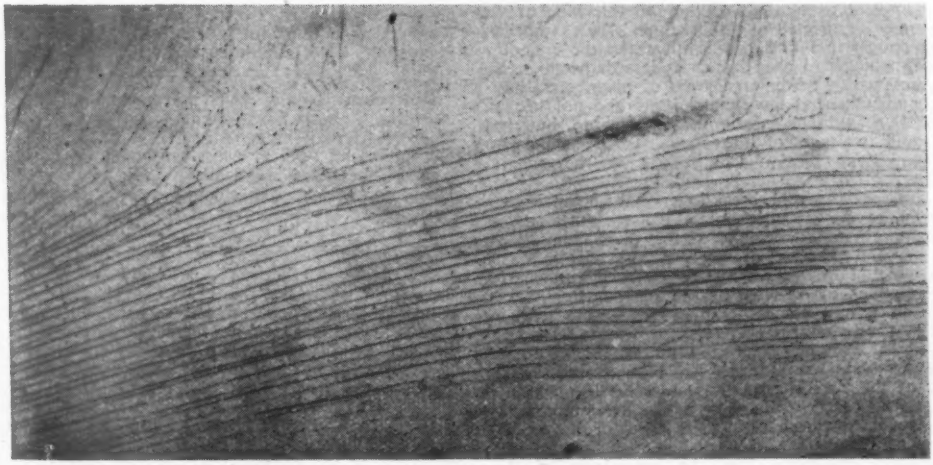


FIG. 5 (½ ACTUAL SIZE).—TYPICAL "CRAZE" CRACKS IN ENAMEL COATING. (CAST-IRON VESSEL.)

Acid-resistant Vitreous Enamels

Examination of Plant Items Discarded from Service

The removal from service of enamelled equipment becomes necessary either (*a*) when corrosion of the basis metal has reached such a state that the plant item is of no further use or would be dangerous if continued in operation, or (*b*) when iron contamination of the product exceeds the allowable limits. Processes vary considerably in this latter respect.

In some cases it is essential to exclude any trace of iron either for reasons of purity of product or to avoid the catalytic effect of iron on the reaction, whilst in other cases complete absence of iron is not necessary. For example, the autoclave liner shown in Fig. 2 had been used for a reaction in which the working conditions were mildly corrosive, and in which a small amount of iron was not detrimental to the product. The liner was permitted to continue in operation for some time after the initial breakdown of the enamel had become evident.

The wastage of the metal beneath the enamel coating had evidently been due to access of corrosive media at occasional discontinuities in the protective layer of enamel, the corrosion of the basis metal being followed in turn by mechanical breakdown of the enamel coating in the immediate vicinity and the consequent gradual increase in the size of the defects. There was no evidence that the enamel itself was insufficiently acid resistant to withstand the operating conditions.

In a more corrosive medium than that involved in the case of the autoclave liner referred to above, the wastage of the basis material is much more rapid and complete penetration of the full thickness of the metal may be effected in a short time. An example of this is shown in Fig. 3, which illustrates the end of a blowleg which had been in service less than one week. The presence of quite large areas of uncorroded basis metal indicates that the enamel itself had not broken down on account of inferior acid resistance, but that the rapid wastage of the metal (mild steel) had commenced at local discontinuities in the enamel coating.

In some instances the breakdown of the enamel coating may be due to mechanical damage sustained in the handling and operation of the plant items. A characteristic example of the wastage of the basis metal which followed mechanical damage to the protective enamel is illustrated by the thermometer pocket shown in Fig. 4. It is of interest to note that in addition to the major damage which brought about the removal of flakes of enamel, fine cracks were also formed in the enamel. These had not permitted ready access of the corrosive media to the basis metal.

In addition to the fracturing of the enamel coating due to accidental mechanical damage, other fine cracks such as the "crazing" illustrated in Fig. 5 have been encountered. In these cases the breakdown of the enamel is attributable to overstress, such as that

(*Continued at foot of next column.*)

A NEW MOULDING MATERIAL

"Foote Prints," the house organ of the Foote Mineral Company, of Philadelphia, Pa., in a recent issue, refers to the use of zircon products as a material for the improvement of moulding sands. In America, we are told, there has been a tremendous increase in the need for light-weight castings of aluminium and magnesium, which are often intricate and must be free from imperfections.

The zircon products are introduced for the purpose of controlling the cooling rate; apparently this has application to core practice. Naturally there must be a proper selection of grain size to take care of surface finish whilst retaining permeability. Two grades, coarse and fine, the latter of the order of passing through a 300-mesh sieve, are available. It is interesting to announce that stocks of both these grades also exist in this country.

U.S. MALLEABLE-IRON CASTINGS OUTPUT

American production of malleable-iron castings for September, 1944, amounted to 74,628 short tons, as compared with 74,297 tons for August, 74,874 tons for September, 1943, and 61,021 tons for September, 1942, according to the Department of Commerce, Bureau of the Census. Shipments of malleable-iron castings for the corresponding periods were 72,821 tons for September, 1944, 70,413 tons for August, 1944, 71,869 tons for September, 1943, and 58,977 tons for September, 1942.

The monthly index of production was 186 for September, 1944, as compared with 185 for August, 1944, 186 for September, 1943, and 152 for September, 1942. New orders booked for malleable-iron castings during September, 1944, amounted to 49,502 tons.

Fluorescent Lamps.—A supplement to List No. 980, issued by Siemens Electric Lamps & Supplies, Limited, of 38-39, Upper Thames Street, London, E.C.4, covers the subject of "warm white" in daylight fluorescent lamps. These are identical with the "Sieray" lamps except for colour. No change in circuit conditions is necessary for a changeover.

(*Continued from previous column.*)

brought about by an excessively steep temperature gradient (thermal shock), or by faulty design of the item, *e.g.*, insufficient rigidity. The foregoing examples illustrate some of the types of breakdown of enamel coatings which necessitate the removal from service of the plant item concerned. In all cases it was apparent that where wastage of the basis metal had occurred it had not resulted from any lack of acid resistance of the enamel itself, but to discontinuities in the enamel coating.

(*To be continued.*)

RECLAIMED AND SUBSTITUTE TIMBERS FOR PATTERNMAKING*

By G. OFFILER

Before the present war the timbers commonly used for patternmaking in the foundry were as follow:—SOFTWOODS—Pine (*Pinus Strobus*), Redwood (*Pinus Sylvestris*); MEDIUM HARDWOODS—Baywood, Lime-tree (*Tilia Europœa*); HARDWOODS—Mahogany (*Swietenia*), Teak (*Tectonia Grandis*), Boxwood (*Buxus Sempervirens*).

From these the patternmaker was able to select the wood most suitable for the construction of any pattern he was called upon to make. The above woods are all imported, and, as the stocks in this country have decreased considerably since the war began, the strictest economy must be exercised in their use. Before the war first-quality pine was very difficult to obtain, and it is likely that for a year or two after the end of hostilities there will still be a scarcity of high-class well-seasoned wood.

Home-grown timbers with properties somewhat similar to those of the imported timbers are now being used, and this use must continue for a period after the war is over. Generally speaking, home-grown wood is inferior to imported wood and the texture, fibre, size and shrinkage of the home-grown timber all add to the difficulties when patterns are being made. It is necessary, therefore, for the maximum quantities of good pine, redwood and mahogany to be reclaimed from existing obsolete patterns and core-boxes constructed of these materials.

Large patterns and coreboxes which have been made for only a few castings, and which are screwed or bolted together, present no difficulty in dismantling, but patterns which have been nailed together call for more skill with the saw during dismantling.

The objections to the use of this reclaimed timber are:—(1) The wear and tear on tools and machines due to the sand impregnated in the surface of the wood, and to any varnish which may remain; (2) the holes through the wood due to nails and screws; and (3) the cost of dismantling.

The first of these objections can be largely overcome by the use of a wire fettling brush. The surface of each piece of wood should be well brushed in all directions before any attempt is made to put it through the planing machine. This brushing will also reveal any nails or screws which may have been left in the surface of the wood. Nail and screw holes are very easily dealt with by recessing the holes to a given size by means of a bit fixed in the borer or drilling machine, the holes being then plugged with plugs made across the grain of the wood. These plugs must be inserted so that the grain will be continuous when the surface is afterwards planed up.

As far as the cost of dismantling is concerned, the need for good, well-seasoned timber at present is such that its importance outweighs the cost of the operation. The use of this reclaimed timber has the advantage that the material has been naturally seasoned, and subjected to moulding conditions and varied temperatures in the pattern store. It can be worked and will maintain a true uniform surface. Patterns made from such timber will retain their size and shape. It is also very suitable for constructing master patterns. When pieces of wood which have old varnished faces are being used, it is important that the varnish be removed either by a wire brush or a planing machine before any of these surfaces are put against a sand-paper disc for working to size. The old varnish is inflammable, and cases have occurred where the fan and dust chambers contained material of this nature which was smouldering, and would start a fire.

Drying and Seasoning of Timber

Natural seasoning is still regarded as the best process when sufficient time can be allowed for it to take place. At present, time is of great importance and artificial methods of seasoning have been extended. The following definition of seasoning is given in a text-book of wood by H. Stone:—"The difference between drying and seasoning is profound. Seasoning is the process by which the perishable contents of the wood, starch, sugar and nitrogenous matters disappear, the starch and sugar being converted into resistant compounds of tannin. This conversion requires water. Natural seasoning allows the time for this to take place. When starch is turned into tannin, a solid passes into solution for which water is necessary."

The natural seasoning of timber allows these changes to take place naturally. The stacking and racking of timber during drying and seasoning are of great importance, and the best conditions must be obtained to allow free currents of air to pass through the whole of the stack. Drying sheds are built east to west; the sides, north and south, are either space bricked or space boarded. Sheds having their sides open have overhanging roofs to prevent the rain from drifting on to the timber, the sides of the shed are north and south, allowing for the maximum of air currents through the deals, boards or planks which are stacked. Laths, not less than ½ in. in thickness, are placed between deals and the distance between each two laths should not be more than 2 ft.; in addition, the laths should be placed vertically in line one above another. The correct spacing of the laths prevents the deals from distorting and allows sufficient space for the free passage of air currents.

The stacks are changed over periodically, the top deals or planks from the stack being placed at the bottom of the new stack. This changing over allows the shrinking of the deals to take place more freely, and prevents many of them from splitting. A good practice is to change to a different construction of the stack, so that the centre deals or planks are resting on their edges, thus presenting the greatest surface area to any air currents.

* A Paper presented before the Sheffield Branch of the Institute of British Foundrymen.

Timbers for Patternmaking

Natural and Artificial Seasoning

The time taken for natural seasoning of timber varies with the type of wood and with the section. Softwoods can be seasoned in three or four years. Hardwoods, on the other hand, take up to ten years to season properly. A good, naturally-seasoned deal board or plank contains approximately 15 per cent. of moisture.

To meet the present urgent need, timbers that have been artificially dried must be used for patternmaking. The aim in artificial seasoning is to ensure the correct chemical changes in the cell contents and the uniform settling of the fibres and cell walls, so that the resulting timber will be similar to the naturally-seasoned wood. The timber is stacked on a truck with equally spaced laths between the deals in the same way as it is usually stacked in the shed. The truck is then run into the drier, which is afterwards sealed. Hot air at a controlled temperature is passed through the drier for a specified period, thus evaporating the moisture out of the wood. The temperature inside the drier is kept below the boiling point of water. Tests are taken by removing one deal at intervals and checking its weight. The loss in weight during drying varies with different kinds of wood, some losing as much as 50 per cent.

The effects of artificially drying pine deals are that turpentine is lost and resin retained, making the wood more brittle and more difficult to work to obtain a smooth surface. The end grain is more porous, thus enabling the wood to take up moisture more quickly from the sand whilst it is in contact with the pattern. Home-grown timbers which have been artificially seasoned are thus less suitable for patternwork than the same timbers naturally seasoned.

The domestic timbers chosen as substitutes must approach pine or mahogany as nearly as possible in their characteristics. Thus, the shrinkage during drying should be low, the surface after working should be smooth and even, the timber should not take up moisture quickly, the grain should be clean and straight.

Choosing the Right Timber

Towards the end of the last war several locally grown timbers were cut and artificially dried to supplement stocks of imported timber. In softwoods, poplar and alder were found to be fairly good. In medium hardwood lime, beech and plane, and in hardwood hornbeam, sycamore, walnut and crab gave the best results. From this assortment it was possible to select a wood suitable for the construction of most types of patterns and coreboxes. Comparison of the cell structure characteristics and qualities of each of these timbers does assist in determining the best kind to choose for the construction of a particular pattern or corebox.

In poplar, the cell structure is uniform, the fibres are stronger than those of pine, there are good lengths of straight grain. The wood is fairly smooth after planing, the end grain rather coarse and porous. Poplar is suitable for making large patterns, but the end grain should never be exposed at the surface of the pattern if it can be avoided.

In alder wood the cell structure is uniform and rather soft, the fibres break easily, and the wood works well, leaving a clean finish. It has a high resistance to the taking up of moisture if it has been properly seasoned. Medium size patterns can be made from this wood when only a few off are required. Owing to its soft nature great care is necessary when moulding from alder patterns to retain the good surface, as light blows of the rammer leave a deep impression in the surface.

Beechwood has a close even texture, is moderately hard, and gives a good clean finish. Special care must be taken when drying and seasoning beech to prevent the setting in of decay, and the butts are cut into planks directly after felling and stacked immediately. When well-seasoned, beech is suitable for the construction of fairly large patterns if the patterns are to be kept in constant use. It is not suitable for making standard patterns owing to its tendency to decay in storage.

In limetree wood the cells are of even texture. The wood works well, leaving a fine smooth surface and good lengths of straight grained planks can be cut from selected butts. The wood is very suitable for patterns requiring a good deal of carving, and also turns very well. Locally grown trees having a girth about 76 in. contain the best wood. This wood can be naturally seasoned in three years.

Planetree wood is fairly hard and difficult to work up to a good surface. Sycamore has a close hard grain, but only the straight grained planks can be used. It turns well and a smooth hard surface can be obtained in this way, but only very well seasoned planks should be used. Hornbeam has a close hard cell structure, but only short pieces of straight grained wood can be obtained from the planks, which makes it suitable only for the manufacture of small patterns. Crab is very similar to hornbeam in its characteristics.

In walnut the well-seasoned straight grained portions of planks are a good substitute for mahogany, as the wood is hard and gives a good smooth surface. It is useful for making medium sized patterns. Walnut stands up well to wear and the abrasive action of moulding sand. Unfortunately, however, stocks of this wood are very low.

It seems likely that for some time after the end of the war stocks of naturally seasoned timbers of the types used for patternmaking before the war will remain scarce. For this and other obvious reasons it is desirable for foundrymen, and for patternmakers in particular, to make themselves thoroughly acquainted with the properties of other available timbers.

Shareholders of F. H. Lloyd & Company, Limited, steelfounders, Wednesbury, have approved the proposals for an increase in the nominal capital from £300,000 to £500,000.

SOME CURIOUS WASTERS

By "CORONER"

Wasters occur through numerous causes, and usually it is fairly obvious where to apportion the responsibility. Cases occur, however, in which it is not so easy to diagnose the cause of the defect and careful thought is necessary to discover the real reason for the waster. The following notes recall a variety of defects of this nature occurring over a fairly long period.

Fig. 1 is a portion of a cylinder and crankcase moulded in halves through X-Y, and up-ended for casting, the casting position being that shown. A number of these cylinders had been made successfully and an increased output was desired. It was then noticed

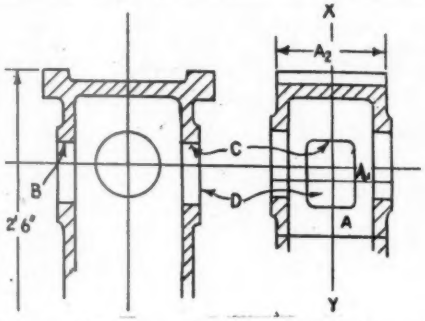


FIG. 1.—METHOD OF MOULDING A CYLINDER AND CRANKCASE.

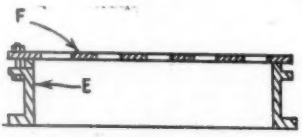


FIG. 2.—MOULDING BOX USED.

that variation was occurring across the width as A, A_1, A_2, etc.; in each case the casting was wider than desired.

As these castings were moulded on a jolt moulding machine, from a pattern mounted on a wooden board, it was thought that the moulding box must be bedding itself into the board, causing the mould to be deeper than desired. An examination of the board revealed this to be impossible, as metal "bumpers" were fitted, which kept the box clear of the woodwork and ensured a sand-to-sand joint.

Still variation occurred, and one casting was scrapped due to a defect at C. Instead of this part of the casting being sharp and definite, as B, this particular side was ragged and lacking in metal. Why was this? The casting exhibited a fairly heavy "flash" along the joint, and it was found that during pouring a slight run-out occurred, which was quickly stopped while pouring was continued.

Moulding Box Control

Here was the answer; during the run-out the metal drained away over the outlet core D, and did not run up sharp again when the leak was sealed. The cause of the main trouble, however, was still unsolved until it was found that some of the castings were coming out true to pattern, and it was then discovered that the moulding boxes used were varying. Some castings were made in boxes specially made for the job with special edge bends to hold the sand in the box, while others—when the demand for an increased output was received—were made in existing middle boxes with a

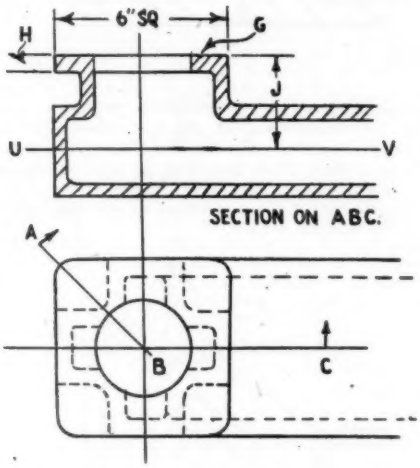


FIG. 3.—A PIPE CASTING WHICH CAUSED DIFFICULTY AT H.

flat grid bolted on the top, as Fig. 2, E and F respectively.

A combination of small things resulted in the variations noticed in the castings. It is well known that jolt moulding machines have a tendency to ram away from any flat bends, such as those formed by the grid F, and should consequently be well rammed underneath by means of a hand rammer. This hand ramming had not always been carried out; consequently the sand underneath the bends was soft, and on the moulds being turned over and carried to the drying stoves, the weight tended to settle away from the joint. This, together with the tendency of some of the bolts keeping E and F together, sometimes getting loose, cause the "flash" on assembly, and the resultant increase in the width of the casting.

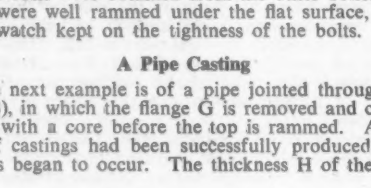
The real remedy was the use of boxes with correctly

Some Curious Wasters

shaped edge bends, but while these were being made, good results were obtained from the other boxes when these were well rammed under the flat surface, and a close watch kept on the tightness of the bolts.

A Pipe Casting

The next example is of a pipe jointed through U-V (Fig. 3), in which the flange G is removed and covered down with a core before the top is rammed. A number of castings had been successfully produced, when defects began to occur. The thickness H of the flange



FIGS. 4 AND 5.—FIG. 4 (UPPER) SHOWS CHAPLET POSITIONING ASSOCIATED WITH A CRUSH, AND FIG. 5 (LOWER) POSITIONING FOR ITS AVOIDANCE.

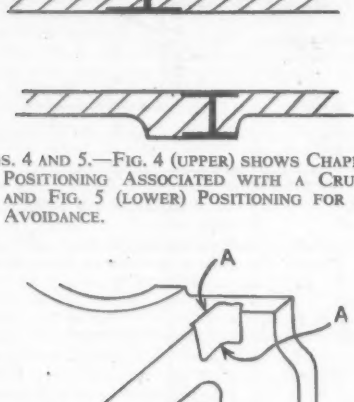


FIG. 6.—THE DEFECT—A DEPRESSION —AT A-A WAS COVERED BY A THIN SHELL OF METAL.

was varying, as also the distance J from the face of the flange to the centre line, in each case the dimension being under those desired. The cause of this defect was traced to a change of operative making the job. After removing the flange and covering down with the core, this particular man pressed it down unduly, and also, when completing the ramming of this half-pattern, exercised too much effort over this particular part, thus pressing it down further. A piece of wood, of the thickness of the flange, and which could be easily withdrawn through the mould after the pattern was removed, placed on the pattern after the flange was removed and before the placing of the covering core, would have prevented the possibility of this core being pressed down too far, and was the cure adopted.

A Chaplet Causes Defect

The third example is one in which a casting was scrapped because of a hole through the wall of the casting, near where a chaplet was placed. As in all cases in which chaplets are used on thin surfaces, a boss should be provided to make an extra thickness to ensure the complete fusion of the chaplet on casting. In this case the cause of the trouble was that the boss was placed in the top of the mould, while the chaplet was put on top of the core and, when the mould was closed, the edge of the boss was crushed by the chaplet, as this was out of position. The correct place for the boss would have been in the core; then everything would be in sight and the chaplet easily positioned and the top closed without the fear of a crush. Fig. 4 shows the position of the boss in which the crush occurred, while Fig. 5 is the ideal.

Fig. 6 is a scrap view of a corner of a casting which was amongst the most curious wasters ever seen by the writer. The casting was moulded in halves on a machine and dried. The defect occurred in one of the top corners at the junction of a flange with the main body of the casting and, on fettling, exhibited a clean depression in both the flange and the body. The reason for this was something of a mystery. The edges A-A showed signs of roughness and the fettler said that after sand-blasting the casting, a shell of metal was over the defect, which, on knocking in, revealed the depression.

But how should the mould be cracked? It was examined after drying and before assembly, and appeared satisfactory. Further examination of the defective casting suggested that a core forming an outlet from the body which came through the side slightly to one side of the defect may have been the cause. If, on assembly, the top touched hard on this core, it may have been sufficient to start a crack. Indeed, on trying the top and lifting for examination—as is the usual practice with this job—it might not have revealed any disturbance of the mould, as it in all probability only occurred on final closing and cottering. Such are some of the curious wasters occasionally met with in the course of a foundryman's daily work.

POROUS METAL FOR BEARINGS

While dense material is essential for certain products, in others it is very desirable. CARL CLAUS in an article on "Metal Sponges" published in "Metal Progress," points out that wherever friction has to be met between moving parts, as in bearings and in gears, a porous metal structure filled with suitable lubricants gives an ideal condition for maintaining an oil film, the latter for reducing friction and preventing seizure of mating surfaces. It is interesting that even without the intervening oil film seizure does not occur in porous structures due to the spongy nature which seems to prevent adjoining metal particles from welding together.

INSTITUTE ELECTS NEW MEMBERS

At a meeting of the Council of the Institute of British Foundrymen, held at the Waldorf Hotel, Aldwych, London, W.C.2, on January 20, the following were elected to the various grades of membership.

FIRST LIST

As Subscribing Firm Members

African Malleable Foundries, Limited, Lincoln Road, Industrial Sites, Benoni, Transvaal (representative, R. N. B. Norris); Crossley Bros., Limited, 140, Broadstone Road, Reddish (representative, J. Ikin); Forrest & Sym, Phillips Park Road Ironfoundry, Manchester (representative, Ralph Sym).

As Members

H. Berry, metallurgist, J. Blakeborough & Sons, Brighouse; C. Cash, engineer, Tackfield Foundry, Darwen; R. E. Collier, works superintendent, Buckley & Taylor, Limited, Oldham; J. Easthope, foundry manager, J. Vessey & Sons, Sheffield; P. S. Eustace, managing director, Wimbledon Foundry, London, S.W.; F. C. Evans, technical manager, Langley Alloys, Limited; B. J. Franklin, B.Sc., foundry superintendent, Morris Martin, Limited; E. Hall-Craggs, W.F., B.A., A.M.Inst.C.E., managing director, Gascoignes Non-Ferrous Foundries, Limited, Reading; R. Hulley, steel department manager, T. Turton & Sons, Sheffield; J. James, foundry manager, Newton, Chambers & Company, Sheffield; A. P. Jesshope, A.M.I.Mech.E., managing director, Jesshope, Limited, Stoke-on-Trent; J. A. Evans, manager, Callender's Cable & Construction Company, Leamington Spa; M. W. Kuhn, managing director, Kresta Foundry & Engineering Company; J. K. Locke, B.Sc., foundry manager, Magnesium Electron, Limited, Eccles; W. Lowe, foundry foreman, Buckley & Taylor, Oldham; F. R. Martin, senior chargehand moulder, T. Richards & Sons, Bristol; D. Monkhouse, foundry manager, J. Woods, Ramsbottom; A. Proud, foundry manager, Bagshawe & Company, Dunstable; R. Quinn, metallurgist, A. H. Mould & Sons; W. W. Stevenson, A.Met. (Shef.), F.R.I.C., A.M.I.Chem.E., chemical engineer, United Steel Companies, Limited, Sheffield; N. L. Tombs, patternmaker, Magnesium Castings, Limited, Slough; J. P. Varma, chief metallurgist, Mukand Iron & Steel Works, Bombay; E. R. Webb, metalgraphist, Jarrow Metal Industries, Limited, Jarrow; R. J. Williams, foundry foreman, P. & A. Campbell, Bristol.

Transfers from Associate Member to Member

F. Brown, assistant foundry superintendent, G. Blair & Company, Newcastle-upon-Tyne; G. C. Pierce, foundry manager, Elliott Bros., London.

Transfer from Associate to Member

R. Masterton, foundry manager, Moston Malleable Castings Company, Limited, Prestwich, Lancs.

As Associate Members

J. C. R. Baker, moulder, G. Adams & Sons, Bristol; A. J. Batterham, production manager, Qualcast, Limited, Derby; G. A. Brooke, metallurgist, Crofts (Engineers), Limited, Bradford; W. Clayton, chargehand, Buckley & Taylor, Oldham; W. J. Cottam, chargehand, Craven Bros., Manchester; A. E. Davies, foundry manager, T. Crompton & Sons, Manchester; E. V. Dewhirst, metallurgist, Crofts Associated Industries, Limited, Bradford; J. C. Dowie, foreman, Hillside Foundry & Engineering Company, Leven, Fifeshire; N. Edwards, patternmaker, Bamfords, Limited, Uttoxeter; E. Kay, foundry superintendent, Humber, Limited, Coventry; H. V. Gilbourne, floor-moulder, Rutland Foundry; A. S. Grocock, time study engineer, D. Brown & Sons, Penistone; P. W. Grunsell, assistant to foundry manager, W. Jessop & Sons, Sheffield; J. Gunstone, foundry estimator, Edgar Allen & Company, Limited, Sheffield; H. C. Hancock, chargehand, Stanton Ironworks, Limited; R. McDonald, assistant metallurgical chemist, Head, Wrightson, Stockton-on-Tees; J. Marsden, furnaceman, Rochdale Aluminium & Bronze Foundry; W. Moore, chargehand patternmaker, Hepworth & Grandage, Bradford; H. W. Olsen, director, Wm. Olsen, Limited, Hull; H. Padley, patternmaker, Hepworth & Grandage, Limited, Bradford; F. C. Payne, metallurgical student, Dawson, Payne & Elliott, Otley; W. H. Sabin, foundry manager, Ham, Baker, Limited, Oldbury; A. H. Reece, foreman moulder, G. Blair & Company, Gateshead; J. H. Rhodes, foreman, Brytallium Metal Company, Leigh, Lancashire; R. W. Shipp, chargehand moulder, Modern Foundries, Limited, Halifax; W. Sleight, chief draughtsman, Richardson & Cruddas, Bombay; J. C. Smith, foundry planner, E. Allen & Company, Limited; S. Smith, patternmaker, Bagshawe & Company, Limited, Dunstable; E. Spenceley, time study engineer, D. Brown & Sons, Penistone; R. Taylor, engineering patternmaker, Lawton & Brierley, Rochdale; J. A. Tew, supervisor, W. Jessop & Sons, Limited, Sheffield; W. P. Thomson, foreman moulder, Morris & Martin, Limited, Port Elizabeth; N. Thornton, assistant foundry manager, Roberts Castings, Huddersfield; R. E. Upex, head foreman, T. Summerson & Son, Darlington; A. E. Webb, iron moulder, G. Adlams & Sons; A. J. Webster, patternmaker, Northern Coachbuilders, Limited, Middlesbrough; J. T. Willis, foreman moulder, W. Jessop & Sons, Sheffield; J. W. Wilson, moulder, Eagle Brass Company, South Germiston, Transvaal; L. Wood, foundry production controller, Meldrums, Limited, Manchester.

Transfer from Associate to Associate Member

S. Stanworth, foundry manager, T. Ashworth & Company, Burnley.

As Associates

J. Aston, foundry metallurgist, Auto-Malleable, Limited, Bradford; J. W. Ashworth, engineering moulder, R. W. Crosthwaite, Middlesbrough; J. F. Crump, assistant to works manager, Hill Top Foundry, West Bromwich; W. R. Dowson, core maker, Head, Wrightson, Limited, Stockton-on-Tees.

As Associate (Students)

F. Bridson, apprentice moulder, Davy & United Roll Foundry, Middlesbrough; N. Dixon, apprentice

Institute Elects New Members

patternmaker, Dorman, Long & Company, Middlesbrough; A. M. Evans, apprentice patternmaker, Rhondda Engine Works; A. G. Farnsworth, foundry student, Rolls-Royce, Limited, Derby; D. Hickman, apprentice patternmaker, Cochrane's, Limited, Middlesbrough; I. Jobson, apprentice patternmaker, R. W. Crossthwaite, Limited; F. Lamb, apprentice foundry draughtsman, Pease & Partners, Middlesbrough; M. Meynell, apprentice patternmaker, Middlesbrough; S. Nicholson, apprentice iron moulder, W. Richards, Middlesbrough; R. Redhead, apprentice moulder, I.C.I., Middlesbrough; W. O. Robson, apprentice moulder, R. W. Crosthwaite, Middlesbrough; R. S. Wilson apprentice patternmaker, Dorman, Long & Company, Middlesbrough; J. Yates, apprentice steel moulder, Davy & United Roll Foundry, Middlesbrough; R. A. Youngs, apprentice patternmaker, Cochrane's, Limited, Middlesbrough.

SECOND LIST

As Subscribing Firm Member

W. A. Baker & Company, West Gate Ironworks, Town Dock, Newport (representative, Brynmor Jones, D.Sc., F.R.I.C.).

As Members

W. Blake, director, David King & Sons, Limited, Glasgow; E. Coates, foundry manager, T. Dudley, Limited, Walsall; W. L. Cole, director, Warwill, Limited, Abertillery; D. Killingworth, technical assistant, Spike Is. Foundry, Lincoln; T. M. Saunders, manager, Saunders & Connor, Barrhead; G. Ure, director, Smith & Wellstood, Limited, Bonnybridge.

As Associate Members

R. P. Bell, foreman moulder, Grangemouth Iron, Falkirk; W. E. Brealey, moulder, Stanton Ironworks, Limited; J. R. Charlton, foundry foreman, Argus Foundry, Glasgow; H. F. Cornish, coreshop foreman, Cwmbran Engineering Company; J. W. Cornish, foundry production chargehand, Cwmbran Engineering Company; H. D. Foster, engineer and draughtsman, Argus Foundry, Glasgow; A. French, metallurgist, Hepworth & Grandage, Limited, Bradford; J. E. Fry, experimental officer, Projectile Development; R. Gardner, chemist, Harland & Wolff, Limited, Glasgow; F. F. Godson, patternmaker, Ruston & Hornsby, Lincoln; T. Goodband, foundry foreman, Ruston & Hornsby, Lincoln; G. A. Hardy, pattern foreman, Ruston & Hornsby, Lincoln; F. Hoult, supervisor, Ruston & Hornsby, Lincoln; T. Hunter, foreman moulder, Federated Foundries, Scotland; T. Jamieson, assistant foreman patternmaker, Grange Iron Works, Falkirk; A. Jordan, coreshop foreman, Ley's Malleable Castings, Derby; A. B. Langton, foreman moulder, Ridding Works; P. Lawless, foreman moulder, Grangemouth Iron, Falkirk; H. Martin, foreman, Ruston & Hornsby, Lincoln; J. Moncaster, foreman moulder, Ruston & Hornsby, Lincoln; V. G. Millington, leading chargeman, Ajmer, India; W. H. Minckley, senior foreman, Ruston & Hornsby, Lincoln; J. McGill, patternmaker, Qualcast, Limited, Derby; G. McKinlay, iron moulder, Hy. Balfour, Limited, Leven; C. S. Pearson, foreman patternmaker, Ruston & Hornsby, Lincoln; E. D. Powley, maintenance foreman, Ruston & Hornsby, Lincoln; R. Sewell, foreman, Ruston & Hornsby, Lincoln; J. Souter, assistant foundry manager, Qualcast, Limited, Derby; A. Spray, departmental manager, Beeston Boiler, Notts; J. Steele, steel moulder, Clyde Alloy Steel Company; Ed. Stout, assistant metallurgical chemist, Hy. Balfour & Company, Leven, Fife; P. Williams, metallurgical observer, Guest, Keen, Baldwin, Cardiff.

As Associates

R. Dowden, manager's assistant, R. W. Crosthwaite, Limited, Middlesbrough; R. Griffiths, costing clerk, J. Williams & Sons, Cardiff.

As Associates (Student)

J. Evans, apprentice moulder, Brown, Lenox, Pontypridd; K. Evans, apprentice engineer, Rhondda Engineering Works; A. D. Gardner, apprentice moulder, Brown, Lenox, Pontypridd; L. Tarr, apprentice moulder, Brown, Lenox, Pontypridd; C. Tregoning, apprentice patternmaker, R. T. George, Rhondda.

THIRD LIST

As Subscribing Firm Members

Consett Iron Company, Limited, Consett Iron Works, Consett, Co. Durham (representative, J. H. Butler); Noble & Lund, Limited, Northern Machine Tool Works, Gateshead (representative, P. Noble); C. A. Parsons & Company, Limited, Heaton Works, Newcastle-upon-Tyne (representative, H. Smith).

As Members

N. Charlton, metallurgist, C. A. Parsons & Company, Limited; F. Greaves, A.M.C.T., assistant manager, C. A. Parsons & Company, Limited; J. M. Maloney, works manager, Ferrous Light Castings, Limited, Warrington; T. R. Savage, metallurgical chemist, E. Jopling, Limited, Sunderland; B. Williams, Lloyd's surveyor, Lloyd's Register of Shipping.

As Associate Members

R. H. Diamond, foundry supervisor, Elder Dempster Lines; J. G. Dodds, iron moulder, Noble & Lund, Limited, Gateshead-upon-Tyne; E. Farrow, moulder, Jarrow Metal Industries, Limited; V. Hannant, metallurgical chemist, "Wilson's" Forge (1929), Limited, Bishop Auckland; B. M. Hardman, works chemist, Davy & United Roll Foundry, Middlesbrough; W. A. Haswell, foundry foreman, Lumsden Machine Company, Limited, Gateshead-upon-Tyne; F. Hodgson, assistant foreman, Westinghouse Brake & Signal Company, Limited, Chippenham, Wilts; M. M. Hodgson, metallurgical chemist, North Eastern Marine

(*Continued on page* 137, *column* 2.)

METAL PRICE UNCERTAINTIES

BY "ONLOOKER"

So fallible is the human memory and so quickly do people accustom themselves to new and often enough remarkable situations that even the immediate past seems to be unreal and sometimes unbelievable in the light of current events. The war years, of course, now stand like a barrier between to-day and the "thirties" of this ill-starred 20th century. That decade just before the war was filled with alarms, and the shadow of impending war lay across the path of the nations, but the main difference between then and now is that whereas we were as individuals and communities reasonably free, the present finds us regimented, directed and instructed to a degree we should never have dreamed possible. This, however, is not the end of the story, for these conditions seem to breed hallucinations in the minds of people normally gifted with a full measure of common sense. In short, these victims of bureaucracy are imbued with the idea that all difficulties and troubles can be smoothed away if the problem is handed over to the Government for solution. On the Government side there are doubtless those who would shake hands with the disciples of the control cult and undertake to put every activity under the ægis of Whitehall, but we may be sure that there are other counsels which sound a warning note against the creation of a Frankenstein monster in the guise of a regimented and robot population.

Future of Control

The early days of control in non-ferrous metals were somewhat disconcerting to a community accustomed to the regulation of its own affairs, and from time to time during the period of the Ministry of Supply's surveillance, which is now in its sixth year, the trade has joined issue with the authorities on one point and another. Co-operation, however, has been the cement which has bound the fabric of control together, and there cannot be any doubt that in the special circumstances and amid the clash and din of war a really good job of work has been accomplished. It should not be forgotten, however, that in effect it has been the voice of authority that has prevailed, and the non-ferrous industry has, albeit with a reasonably good grace, toed the line. So far so good, but the prospect of peace and the release of metal for domestic and export purposes has vitalised the commercial body, growing content and perhaps even lazy on a diet of wartime directions. This growing vitality has even galvanised the members of that body, or some of them at any rate, into taking stock of the situation as it is at present, and even more as it is likely to be in the near future. They find, as is perhaps not unnatural, that the system of Government intervention is firmly entrenched, and they envisage the unpleasant truth that the post-war world is likely to be a very different place from that on which the curtain was rung down in 1939.

Value of the Hedging System

That is not to say that in pre-war days everything was plain sailing, for this certainly was not the case. Industry could and did, however, protect itself against price shocks by means of the hedging system, which, in the case of the non-ferrous trade, operated on the London Metal Exchange. Values altered, but these changes came from day to day, and could be faced with a degree of equanimity. Under a system of Government control, which in effect means monopoly, adjustments in the ruling price come without warning, and are usually sufficiently violent to cause consternation and loss of confidence. In making these price adjustments authority exercises arbitrary powers, and it may well be that the alteration is due far more to political prompting than to anything arising out of the economics of the situation. Disturbing as such incidents are in a time of emergency, their projection into the post-war world would indeed create conditions akin to nightmare.

INSTITUTE ELECTS NEW MEMBERS

(*Continued from page* 136.)

Engineering Company, Limited, Wallsend; R. Irish, iron moulder, Noble & Lund, Limited, Newcastle-upon-Tyne; C. Nicholls, metallurgical chemist, North Eastern Marine Engineering Company, Newcastle-upon-Tyne; T. E. Reece, moulder, Clarke Chapmans & Company, Gateshead; L. H. Smith, chargehand moulder, Fine Castings, Limited, Bristol; G. H. G. St. Claire-Johnson, assistant engineer, Strebor Diecast, Rochdale; N. Thomas, iron moulder, Noble & Lund, Newcastle-upon-Tyne; J. Wood, moulder, Hick Hargreaves, Limited, Bolton; J. D. Wright, assistant foreman patternmaker, St. Peter's Works, Newcastle-upon-Tyne.

As Associates

E. D. Douglas, iron moulder, R. W. Crosthwaite, Limited, Middlesbrough; M. Hodgson, moulder, Consett Iron Company; J. H. C. Inness, manufacturers' agent, T. J. Priestman, Limited, Middlesbrough; F. Lister, foreman moulder, C. A. Parsons & Company Limited; R. O'Brien, assistant to foundry superintendent, Matthew Swain, Limited, Manchester; J. R. Stevenson, chargehand repetition foundry, C. A. Parsons & Company, Limited; K. S. Stringfellow, patternmaker, Consett Iron Company.

As Associates (Student)

F. Manton, chemist, Cochrane's (Middlesbrough) Foundry; P. Marsden, apprentice patternmaker, Dorman, Long & Company, Middlesbrough; J. F. Soakell, apprentice patternmaker, Dorman, Long & Company; E. Walker, apprentice chemist, Cochrane's Foundry, Middlesbrough.

The Association Technique de Fonderie proposes to hold its first conference since the German occupation in Paris next October.

CORRESPONDENCE

[We accept no responsibility for the statements made or the opinions expressed by our correspondents.]

SHRINKAGE OF SPOKED WHEELS

To the Editor of THE FOUNDRY TRADE JOURNAL.

SIR,—The excellent articles, "Methods and Problems Indigenous to a General Engineering Ironfoundry," in your recent issues have been followed with interest by the writer. But at the end of the article, under the above title, in your issue of January 18, it appears that a 9-in. cast-iron boss has a contraction of 1½ in.!

My firm have made many rope pulleys, of the kind used for service lifts in restaurants, having a cast-iron rim, suitably shaped to take a hemp rope, connected to a cast-iron boss by mild-steel spokes. The contraction allowance on all sizes of pulleys is ⅛ in. per ft., and as we always cast the rim first and allow to cool before casting the boss, the conditions are similar to those described in the article, but with this difference, we have never had a spoke pull out let alone to the extent of ¼ in.!

A much better method of ensuring spoke tightness than by splaying is to grind a series of half-round grooves in the ends. This is done on the corner of the grinding wheel. The ends of the spokes must be free of rust and are usually painted with a mixture of red lead powder and paraffin.—Yours, etc.,

W. S. KINGDON.

4, Hamlyn Lane, Exeter.
January 21, 1945.

To the Editor of THE FOUNDRY TRADE JOURNAL.

SIR,—In reply to your correspondent, Mr. W. S. Kingdon, regarding the shrinkage on the boss of a spoked wheel, both Mr. Doig and myself feel that the wording in the sentence referred to in our Paper has created quite a false impression in your correspondent's mind about the extent of the shrinkage. We should have made it clear that each spoke was not pulled from the rim for ¼ in.

Indeed, while all spokes were displaced, more or less, only at one side of the wheel periphery were they pulled out the stated distance. This, we are sure, was due to some distortion effect on the mild-steel rim, which came into effect after the welding had fractured in one or two of the spokes.

We are equally sure that your correspondent is mistaken in drawing an analogy between a cast-iron rim and a mild-steel one. In the former the spokes are well and truly seated in the rim and boss by the method of casting them in. Indeed, some surface fusion is bound to have occurred.

In the case of the steel rim, the spokes were fillet welded on to the rim and, of course, when contraction stresses were applied, the assembly failed at the weakest point, namely, the weld. The "springing" of the rim due to these contraction stresses resulted, in some cases, in the spoke collar being drawn ¼ in. away from the steel rim. On the other hand, a circular rim of cast iron with radial stresses applied to it—

(*Continued at foot of next column.*)

GRAY IRON FOUNDERS' SOCIETY

The following Committee chairmen have been appointed by the [American] Gray Iron Founders' Society:—

Cost Committee.—Mr. H. L. Edinger, president of the Barnett Foundry & Machine Company, Irvington, N.J.

Educational Committee.—Mr. Edward C. Hoenicke, assistant to the general manager, foundry division, Eaton Manufacturing Company, Detroit.

Technical Committee.—Mr. Edward L. Roth, president of Motor Castings Company, Milwaukee.

Terms of Sale and Trade Practice Committee.—Mr. Peter E. Rentschler, president of the Hamilton Foundry & Machine Company, Hamilton, Ohio.

To stimulate further investigation and study of the properties of grey irons and to encourage continued research in grey-iron metallurgy, the Technical Committee has established two annual awards for original research reports of outstanding merit on subjects designated by the Committee. For the Paper judged most worthy of special commendation for its merit the award shall consist of a Certificate of Award accompanied by $500.00 in cash. For the Paper considered to be next in order of merit the award shall be a Certificate accompanied by $200.00 in cash. The awards are open to all graduate and undergraduate students in schools of engineering and technology in the United States.

The subjects for this year's awards are:—(1) "Creep Values of Grey Irons at 315 to 425 deg. C."; (2) "Elongation of Grey Irons"; (3) "Impact Values of Grey Irons"; (4) "Machinability of Grey Irons"; and (5) "Modulus of Elasticity of Grey Iron."

The Uttoxeter Urban District Council have received a communication from Fry's Diecastings, Limited, London, S.W.19, asking if there was any foundry accommodation in the district. The Council have instructed the clerk to reply that there were no suitable premises, but excellent industrial sites were available.

(*Continued from previous column.*)

inwards—would be an extremely strong and stable structure.

In such a wheel we would be certain that the steel spokes would strain with the applied contraction stresses before any fracture would be evident in the cast-iron rim. However, in the case in question, cast-iron rims could not be considered. We are grateful to Mr. Kingdon for his hint on ensuring spoke tightness and are gratified by his interest in our Paper.—Yours, etc.,

W. MONTGOMERY.

Henry Balfour & Co., Ltd.,
Durie Foundry,
Leven, Fife.
February 2, 1945.

DALE
DALE
The High-Quality Iron for High-Duty Castings.
Made in seven standard grades or to individual requirements, this iron has a close grain structure and fine graphitic carbon content. It replaces Hematite, and tones up high phosphorus irons.
We also make Dale Refined Malleable Iron to any required specification.
STANTON
DALE Refined PIG IRON
THE STANTON IRONWORKS COMPANY LIMITED
NEAR NOTTINGHAM

PERSONAL

DR. C. C. PATERSON, F.R.S., has been awarded the Faraday Medal by the Institution of Electrical Engineers for conspicuous services in the advancement of electrical science.

MR. E. B. PRESTON has been appointed manager of the London office of C. A. Parsons & Company, Limited, in place of MR. A. M. RANFT, who has resigned owing to ill-health.

MR. H. REES HUMPHREYS, a director of the English Steel Corporation, Limited, and Cammell, Laird & Company, Limited, has been appointed a director of the Darlington Forge, Limited.

MR. R. G. H. TAYLOR, a director of Taylor Bros. & Company, Limited, Manchester, in charge of steel production, has been appointed a special director of the English Steel Corporation, Limited.

MR. E. W. HARDING, who has been on the technical metallurgical staff of the International Meehanite Metal Company, Limited, for some years, and who has developed methods for the statistical control of castings production, has been appointed service manager to the company.

MR. H. SCHOLEY, superintendent of the Stevenson Road, Sheffield, works and rolling mills; MR. G. C. GRANT, superintendent of the Manchester district works; and MAJOR E. I. SCOTT, M.C., London sales manager, have been appointed special directors of the English Steel Corporation, Limited.

MR. BASIL GRAY, superintendent of the Grimesthorpe works of the English Steel Corporation, Limited, has been appointed a special director of the corporation. He served his apprenticeship at the Vickers works and was appointed superintendent at Grimesthorpe in 1934. During the war he has been active as chairman of the Tank Castings Design Committee under the Iron and Steel Control.

DR. C. J. DADSWELL has been appointed a special director of the English Steel Corporation, Limited. He is in charge of drop forging production. For a period during the war, Dr. Dadswell was seconded to the Ministry of Supply, being responsible for the adaptation of foundries for the manufacture of tank parts. He also went to America as chairman of the Ministry of Supply Mission to study tank armour.

MR. G. E. G. GILFILLAN has been appointed a special director of the English Steel Corporation, Limited. He joined the corporation's Vickers works in 1932 at the request of Sir Charles Craven, and in 1934 was appointed superintendent of the forge and engineering sections. He had previously been at the Elswick works of Sir W. G. Armstrong, Whitworth & Company, Limited, where he served his apprenticeship.

MR. ISAAC WILLIAMS, group chief engineer to the South Durham Steel & Iron Company, Limited, and the Cargo Fleet Iron Company, Limited, has retired from active service. He entered the service of the Cargo Fleet Company in 1902, has successively filled the posts of chief draughtsman, works engineer and group chief engineer, and he supervised the modernisation of the group's extensive plants at Middlesbrough, Stockton and West Hartlepool. He has travelled extensively in the United States and in Germany, Belgium, France and other European countries.

MR. W. D. PUGH has been appointed a director of the Darlington Forge, Limited, and made a special director of the English Steel Corporation, Limited. He has been superintendent of the Darlington works since 1936. He began as laboratory assistant with John Lysaght, Limited, Scunthorpe, in 1921, and spent three years as a full-time student at Sheffield University under Dr. C. H. Desch, obtaining an associateship in metallurgy and the Mappin Medal. In 1926 he joined the research department at Vickers works, and later visited metallurgical plants in Germany, Italy, and France. MR. W. S. SCOTT, manager of the armour and heat department at Sheffield, is to be appointed superintendent of Darlington Forge in place of Mr. Pugh, but will be directly responsible to him.

MR. WILLIAM BROWN PICKERING is retiring shortly, after 54 years' service with Hadfields, Limited, 31 years as director and commercial manager. MR. H. HUMPHRIES, Director of Steel Castings and Forgings at the Ministry of Supply, succeeds him as commercial manager. Mr. Pickering, who was born at Crook, Co. Durham, is a past-president of the Sheffield Chamber of Commerce (1933-34), and a member of the executive committee of the Association of British Chambers of Commerce. In the closing years of the last century he visited South Africa and established Hadfields' office in Johannesburg. He also travelled in the U.S.A., Canada, Australia, New Zealand, the Federated Malay States, and Siam. He is chairman of the Steel Castings Manufacturers' Association.

Wills

SWINDEN, DR. THOMAS, director of research of the United Steel Companies, Limited £20,054

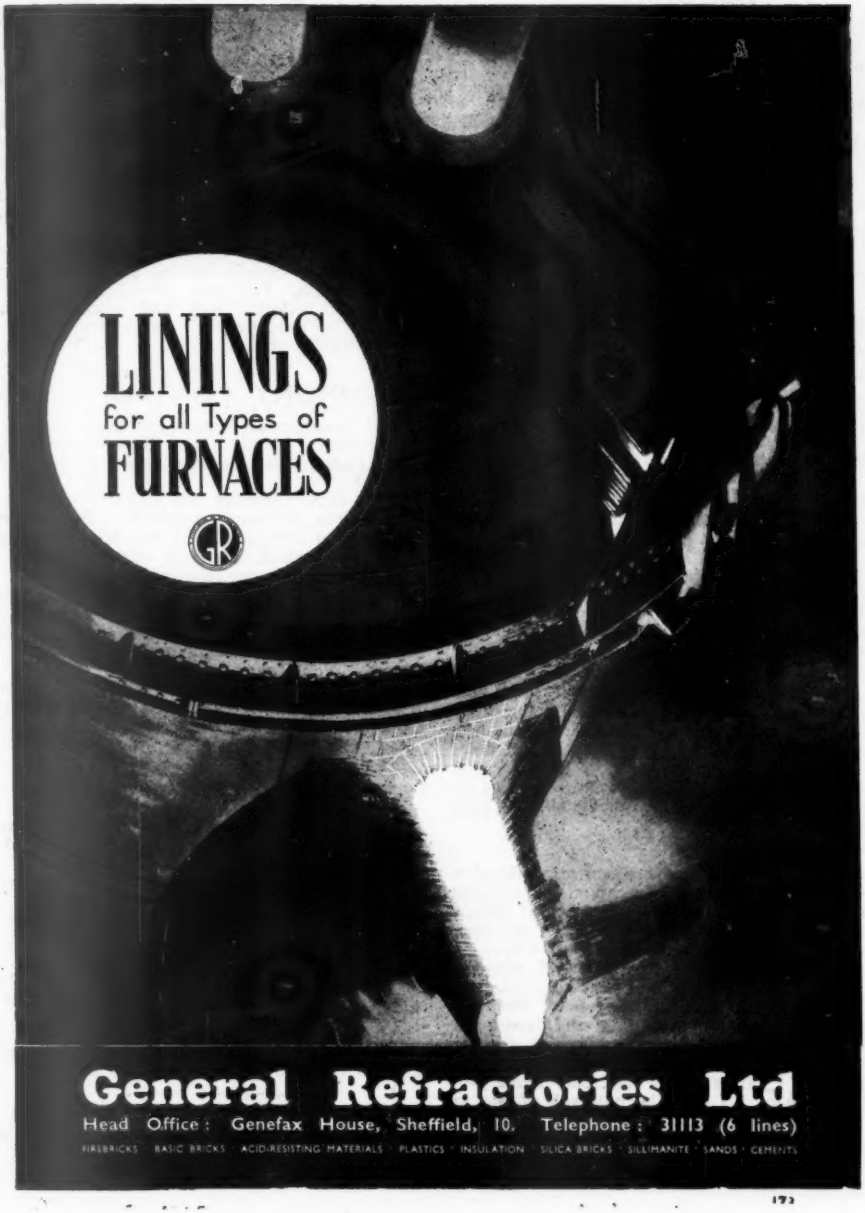
PILKINGTON, J. H., of St. Annes-on-the-Sea, proprietor of T. C. Holden & Company, iron and steel stockholders, of Preston £27,056

WILSON, A. H., of Aberdeen, chairman of Hall Russell & Company, Limited, and a director of the Burntisland Shipbuilding Company, Limited £166,145

BROCKHOUSE, J. T., chairman and managing director of J. Brockhouse & Company, Limited, West Bromwich, and chairman of Albion Drop Forgings Company, Limited, Coventry £95,003

LEE, H. W., of Tunbridge Wells, chairman of the Superheater Company, Limited, director of the Chloride Electrical Storage Company, Limited, and late managing director, J. Stone & Company, Limited, Deptford £264,342

AT THE MONTHLY MEETING of the London Metal Exchange, last week, the chairman, Mr. M. J. D. Wolff, said the Committee was making what progress it could for the early reopening of the Exchange for business. A letter had been received from the Minister of Supply, which said:—"As you are aware, discussions are already proceeding in regard to the arrangements and time of reopening of the London Metal Exchange, and you may rest assured that the merchant interests will not be overlooked."


LININGS
for all Types of
FURNACES
GR
General Refractories Ltd
Head Office: Genefax House, Sheffield, 10. Telephone: 31113 (6 lines)
FIREBRICKS · BASIC BRICKS · ACID-RESISTING MATERIALS · PLASTICS · INSULATION · SILICA BRICKS · SILLIMANITE · SANDS · CEMENTS

OBITUARY

MR. GEORGE SNOWDEN, a director of Marple & Gillott, Limited, iron and steel merchants, of Sheffield, died recently, aged 84. He was with the firm for 45 years.

MR. FRANCIS ALLEN, a member of the council of the Tin Producers' Association, has died at the age of 79. He was chairman of South Crofty, Limited, and Wheal Reeth Tin, Limited.

MR. G. M. PRIESTLEY, foundry engineer to Henry Wallwork & Company, Limited, Red Bank, Manchester, died suddenly on January 27. He was a member of the Lancashire Branch of the Institute of British Foundrymen.

MR. A. H. HAYES died recently at his home in Essex, aged 67. He was for many years a partner in the firm of George Warren & Company, metal merchants and agents, of London, and was well known in the galvanised-sheet trade particularly. He retired just before the outbreak of war.

MR. CHARLES KINGSTON EVERITT, chairman and managing director of Edgar Allen & Company, Limited, Sheffield, died on February 6. He joined the firm in 1882, was appointed a director of the company 26 years later, and became its chairman in 1930. Mr. Everitt was 78 years of age

MR. JOHN WALKER, a former official of Steel, Peech & Tozer, died recently at Harthill, Yorks. He retired in 1939 after 49 years with the company. Mr. Walker became manager of the Rotherham melting shop and after the last war was appointed manager of the Templeborough plant. Later he became chief inspector and occupied that position until his retirement. He was 70 years of age.

MR. HENRY HALL SUMMERS died at Harrogate recently. He was 80 years of age. A prominent figure in the steel industry, and especially the steel-sheet trade, for over half a century, Mr. H. H. Summers was president of John Summers & Sons, Limited, of Shotton, and chairman of the Shelton Iron, Steel & Coal Company, Limited. He was chairman also of the Buckley Colliery Company, Limited, and the Castle Firebrick Company, Limited.

THE DIRECTORS OF Associated Electrical Industries, Limited, propose to increase the capital by creating 1,363,000 8 per cent. cumulative preference £1 shares, to be offered in exchange for the 1,500,000 7 per cent. cumulative preference £1 shares of British Thomson-Houston Company, Limited, an associated concern. In pursuance of the policy of financial consolidation, initiated in 1928, when the A.E.I. group of electrical companies was formed, all the shares and debentures issued by the constituent companies (which include the B.T.H. Company) have been acquired, with the exception of the 1,500,000 7 per cent. cumulative preference £1 shares of B.T.H. The outbreak of war in 1939 prevented steps being taken to acquire these outstanding shares, but the board feels the time has now arrived to complete financial consolidation.

CONTRACTS OPEN

Any date given is the latest on which tenders will be accepted. The address is that from which forms of tender may be obtained.

Bromley, February 28—Castings, for the Town Council. Mr. H. Cliffe, borough engineer, Municipal Offices, Bromley, Kent.

Ogmore, March 5—Manhole covers and other castings, for the Ogmore and Garw Urban District Council. Mr. A. H. Jenkins, engineer and surveyor, Council Offices, Brynmenyn, Glam.

Stourport-on-Severn, February 23—Providing and laying 1,485 yds. lineal of 4-in., 3-in. and 1½-in. dia. cast-iron water mains, together with valves, etc., for the Urban District Council. Mr. L. H. Poole, surveyor, The Council House, Stourport-on-Severn.

Tynemouth, February 24—Cast-iron work: iron pipes and fittings; iron and steel, for the Town Council. The Borough Surveyor, 19-20, Howard Street, North Shields.

ANTIMONY CONTROL REMOVED

The Minister of Supply has made the Control of Non-Ferrous Metals (No. 15) (Antimony) (Revocation) Order, 1945, which came into force on February 8.

This Order revokes the Control of Non-Ferrous Metals (No. 8) (Antimony) Order, 1942, under which the disposal and acquisition of antimony metal, crude antimony sulphide, antimony oxide, golden or crimson sulphide of antimony, and antimony ore were subject to licence. Licences are no longer required for their disposal or acquisition.

Inquiries concerning the Order should be addressed to the Joint Controllers, Non-Ferrous Metals Control, Grand Hotel, Rugby.

Copies of the Order may be obtained from H.M. Stationery Office, or through any bookseller, price 1d. (S.R. & O., 1945, No. 112).

COMPANY RESULTS

(Figures for previous year in brackets.)

Clyde Crane & Booth—Dividend of 15% (same).

Sheepbridge Coal & Iron—Interim dividend of 3%, tax free (same).

Wm. Neill & Son (St. Helens)—Interim dividend of 1½d. per share (same).

Round Oak Steel Works—Net profit for the year to June 30 last, £131,256 (£146,539); dividend of 6% (same).

Steel Developments—Profit for the year to December 31, 1944, £4,567 (£4,565); dividend of 5½% (same); forward, £5,752 (£5,604).

Anti-Attrition Metal—Profit for the year to July 31, 1944, £70,782 (£61,062); dividend of 15% (same); tax, £52,000 (£48,000); forward, £7,178 (£2,021).

MR. H. R. NEWMAN has been appointed general manager of the engineering departments of the Butterley Company, Limited.